

Nickel-Syntactic Hybrid Mirrors, Phase I

Completed Technology Project (2005 - 2006)



Project Introduction

Astronomers strive to see farther and farther into the cosmos. These increased observation distances will gain access to a wealth of information that will enable a better understanding of the universe, and the origins of Earth. To gain these distances larger aperture telescopes are required. Current materials and fabrication processes for space-based mirrors have serious drawbacks that severely limit the size and therefore the performance of optical systems for imagery. These drawbacks fall primarily into the areas of mass properties, structural properties, thermal properties, and fabrication costs. Cornerstone Research Group, Inc. (CRG), proposes to develop a composite material system that will address the drawbacks of conventional materials and fabrication processes for space-based mirrors. This novel composite system will integrate syntactic materials (see background Section 2.4) with electroformed nickel foils to achieve a balance of mass, structural, thermal, and optical properties that dramatically advances the state-of-the-art for space-based mirrors. The composite material will also enable fabrication techniques that are faster and cheaper than current practices.

Primary U.S. Work Locations and Key Partners

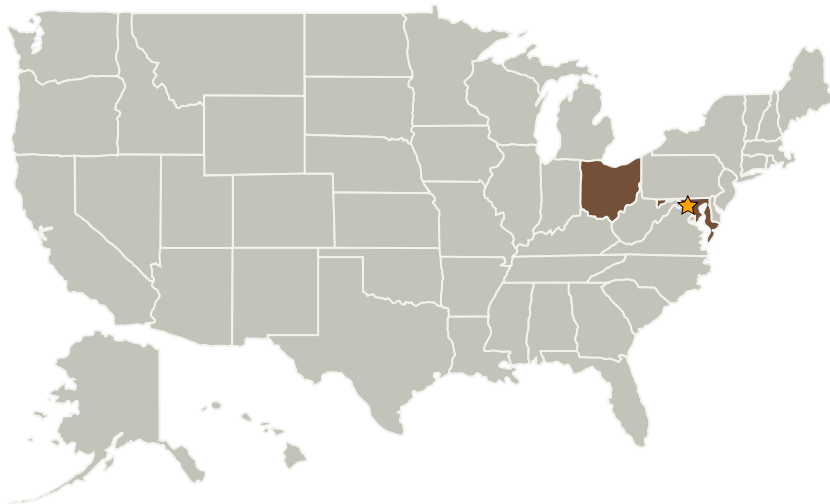
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Organizational
Responsibility**Responsible Mission
Directorate:**Space Technology Mission
Directorate (STMD)**Lead Center / Facility:**Goddard Space Flight Center
(GSFC)**Responsible Program:**Small Business Innovation
Research/Small Business Tech
Transfer

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Organizations Performing Work	Role	Type	Location
★Goddard Space Flight Center(GSFC)	Lead Organization	NASA Center	Greenbelt, Maryland
Cornerstone Research Group, Inc.	Supporting Organization	Industry	Miamisburg, Ohio

Primary U.S. Work Locations

Maryland	Ohio
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Stephen D Vining

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.2 Observatories
 - └ TX08.2.1 Mirror Systems